





Machine Guarding

Four Types of Guards

-  *Fixed*
-  *Interlocked*
-  *Adjustable*
-  *Self-Adjusting*

CITATIONS

No guard on grinders.

Wrong speed or unknown speed on grinding wheel

Machine Guarding

Major Points

- ☆ *Mortar mixer must have guarding over the open face. Many manufacturer sell retrofit guards.*
- ☆ *Mechanical hazards can be found at the point of operation, the power transmission apparatus or at the area of transverse motion.*

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☐ *Fatalities*

- * *Many fatalities have resulted from employees getting caught in rotating shafts such as well boring drills & lathes.*

Machine Guarding

■ *Fixed Guards*

- *A permanent part of the machine*
- *Not dependent on any other part to perform the function*
- *Usually made of sheet metal, screen, bars or other material which will withstand the anticipated impact*
- *Generally considered the preferred type of guard.*
- *Simple and durable*

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■ *Interlocked Guard*

- *Usually connected to a mechanism that will cut off the power automatically*
- *Could use electrical, mechanical or hydraulic systems*
- *Should rely on a manual reset system*

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- *Adjustable Guard*
 - *Very flexible to accommodate various types of stock.*
 - *Manually adjusted*

Machine Guarding

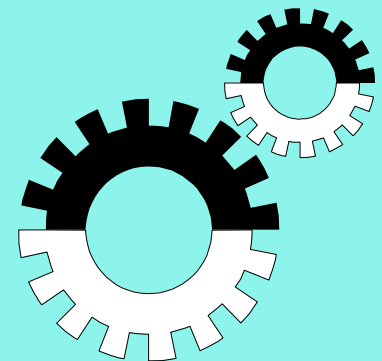
■ *Self-Adjusting*

- *The opening is determined by the movement of the stock through the guard.*
- *Does not always provide maximum protection.*
- *Common complaint- reduced visibility at the point of operation....
“I can’t see what I’m doing!”*

Subpart C Machinery & Machine Guarding (1910.211 - 222)

Standard: 1910.	Machine guards - General	
	212(a)(1)	1,726
	Grinders - Tongue guards	
	215(b)(9)	1,491
	Pulleys	
	219(d)(1)	1,285
	Point of operation	
	212(a)(3)(ii)	1,100
	Grinders - Work rests	
	215(a)(4)	1,027

Number of Serious Violations - FY 94



Machine Guarding



- *This picture, taken through a window, shows an unguarded saw blade.*

Machine Guarding



- *Once inside the building, we find more violations. An ungrounded plug, an electrical cord with an illegal splice.*
- *Don't let these violations sneak up on you!*

Machine Guarding



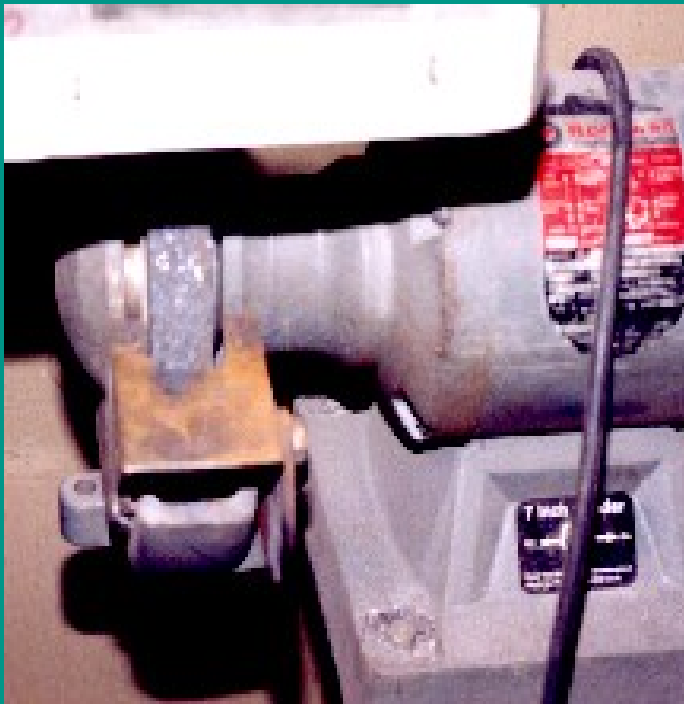
- *This shows a pulley system which has correct guards to keep fingers and tools away from pinch points.*

Machine Guarding



- *This man lost his finger when a machine in a foundry cut it off.*
- *There was no guard in place, as required by law, to keep his finger out of a point of contact.*

Machine Guarding



- *This grinder has a fixed guard on the side to keep fingers away from the moving grind stone*

Machine Guarding



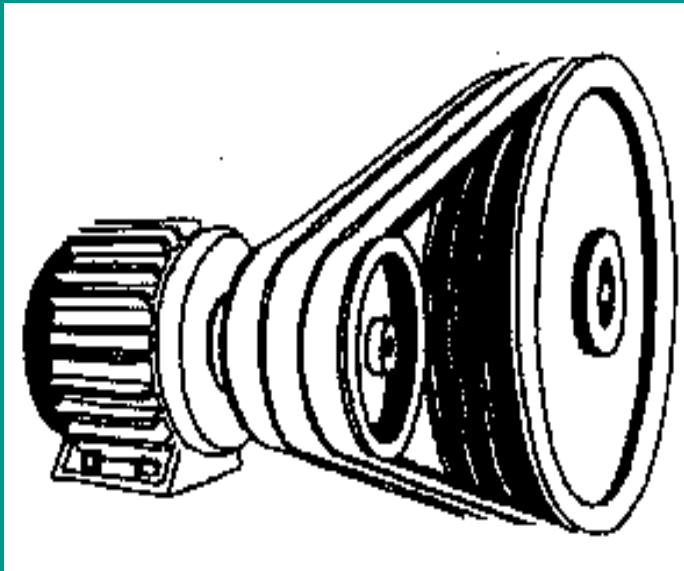
- *This is an example of a self-adjusting guard that automatically moves to accommodate different size stock.*
- *Note the unguarded pulley underneath.*

Machine Guarding



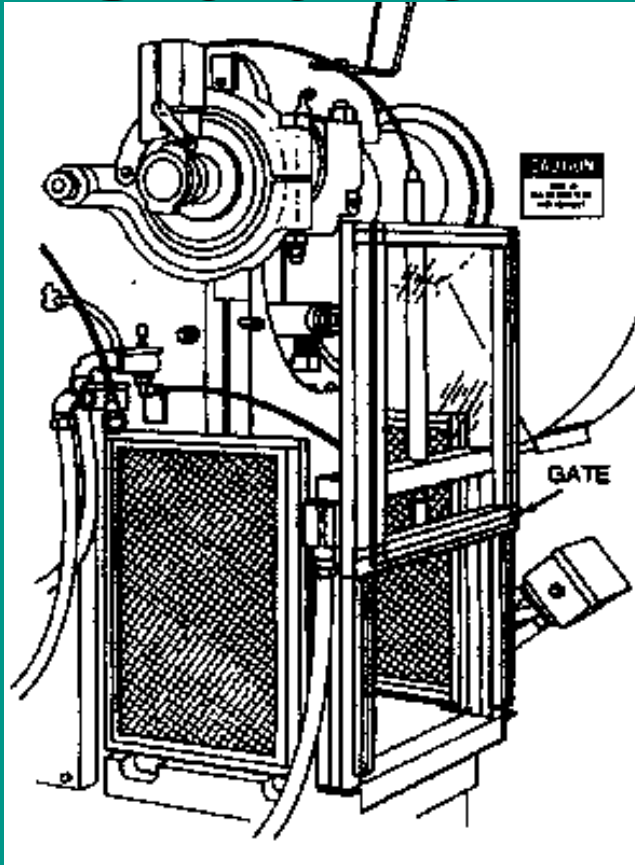
- *This is an example of an adjustable guard.*
- *The operator must move the guard to accommodate different size stock on this band saw.*

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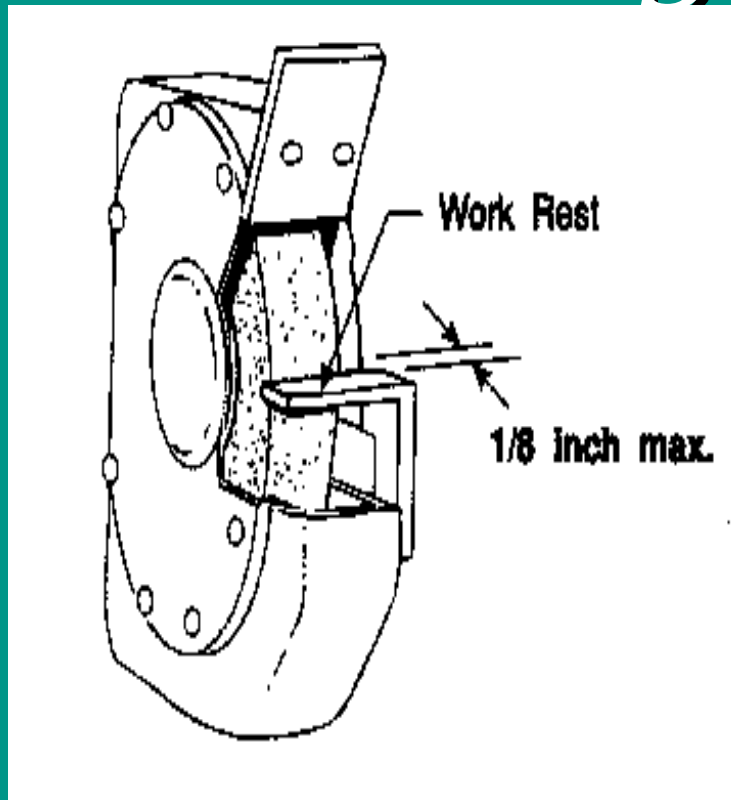
- *Transmission sources such as this should be guarded to keep hands and arms out of them.*

Machine Guarding



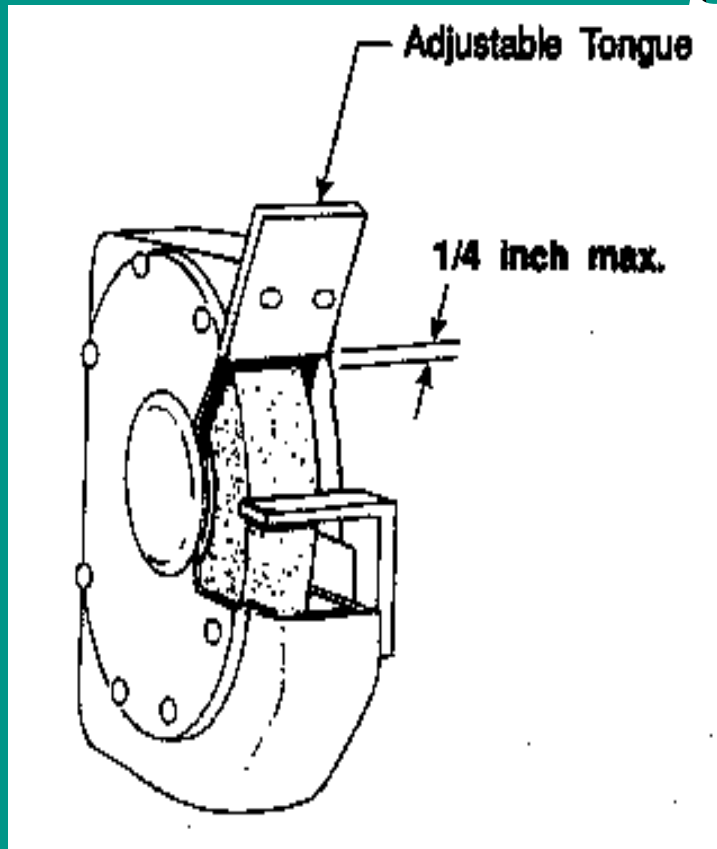
- *This machine is using a gate system to keep hands out of the point of operation area.*

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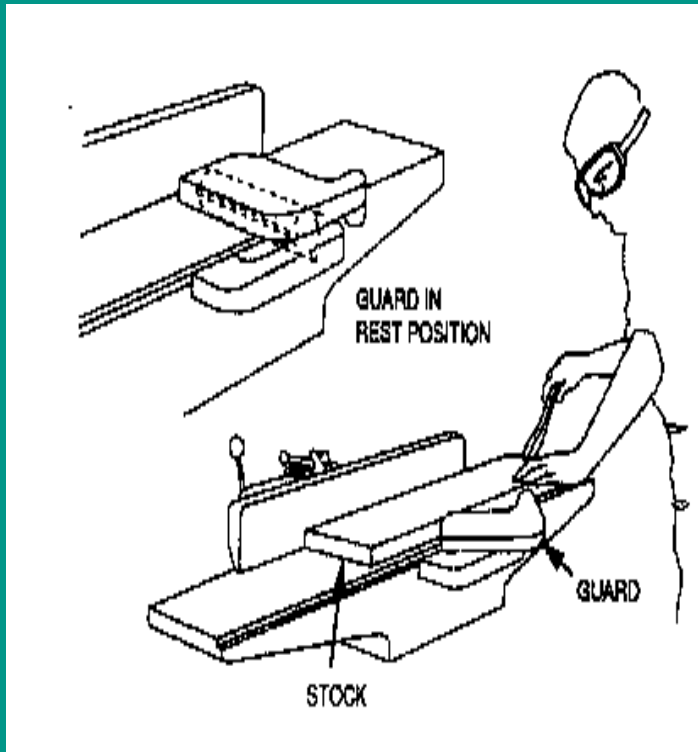
- *Bench Grinders require a work rest with a maximum clearance of 1/8 inch to insure that the work does not get drawn into the grinding wheel.*

Machine Guarding



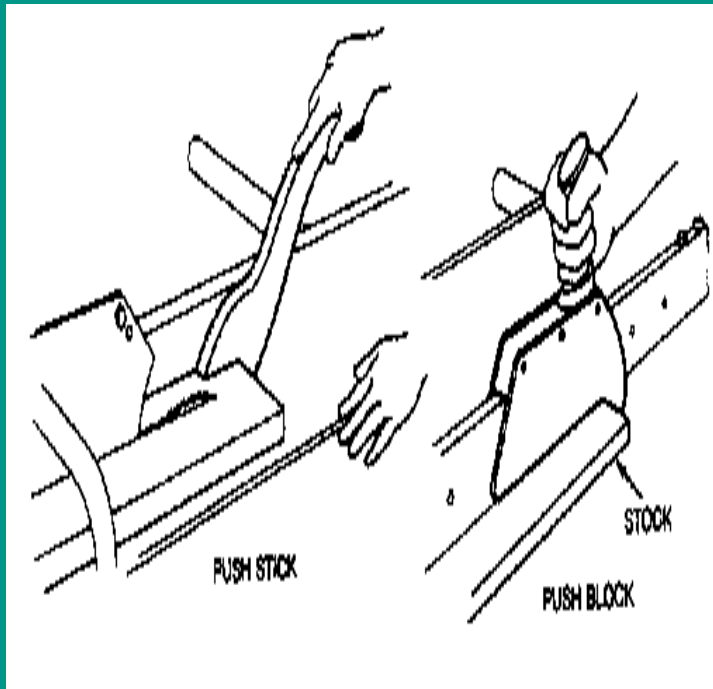
- *The top clearance on a bench grinder should not exceed 1/4 inch.*

Machine Guarding



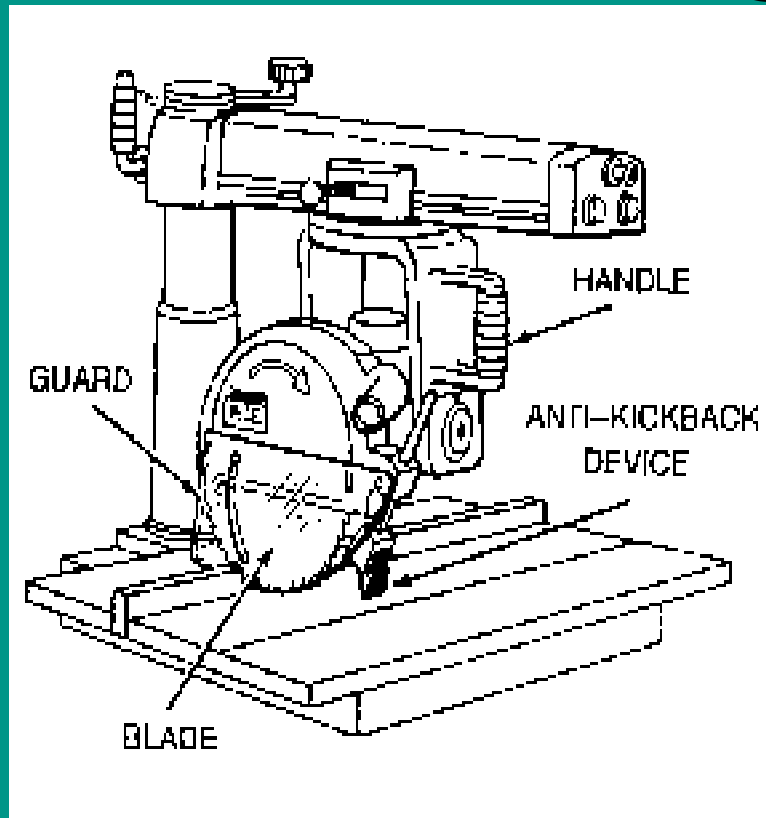
- *This wood working device has an adjustable guard that moves as the wood is fed into it.*

Machine Guarding



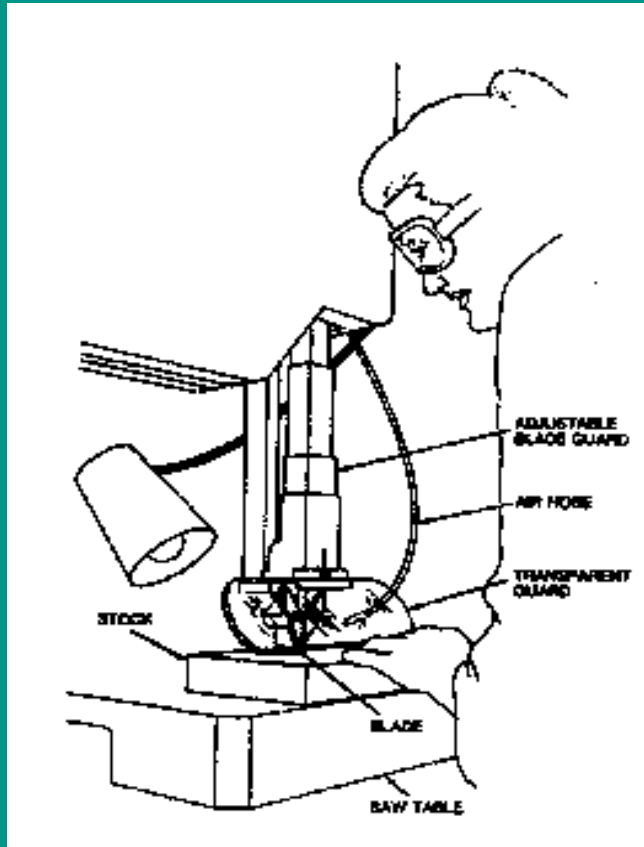
- *When working closely with wood cutting machines, a push stick can keep your fingers on the end of your hands!!*

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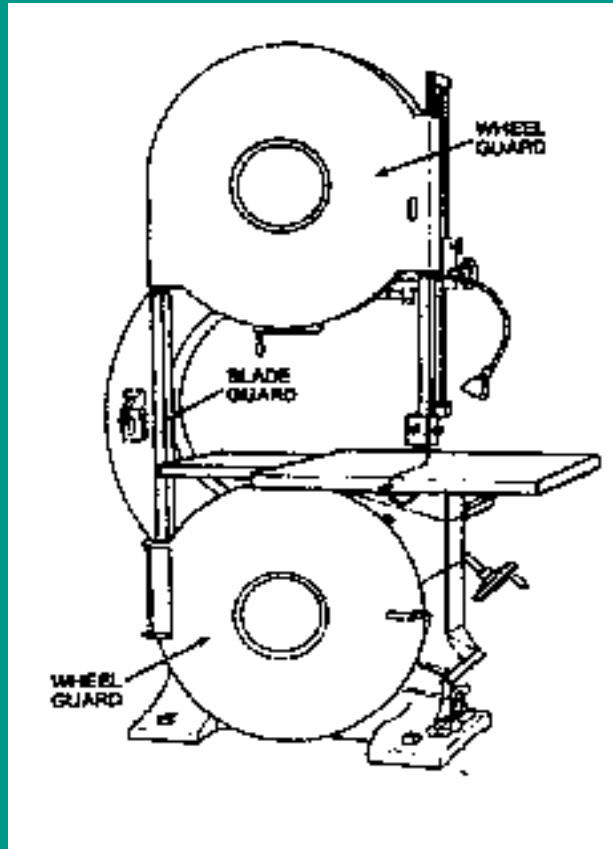
- *This saw has:*
 - *a blade guard*
 - *anti kickback device*
- *It should have a retracting device to automatically bring the saw back into position*

Machine Guarding



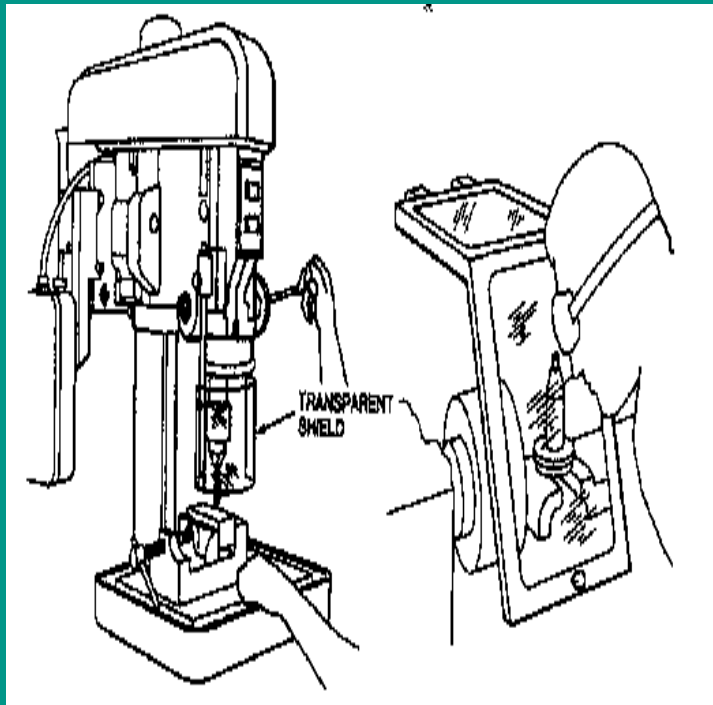
- *This worker is protected from the moving blade by an adjustable guard.*

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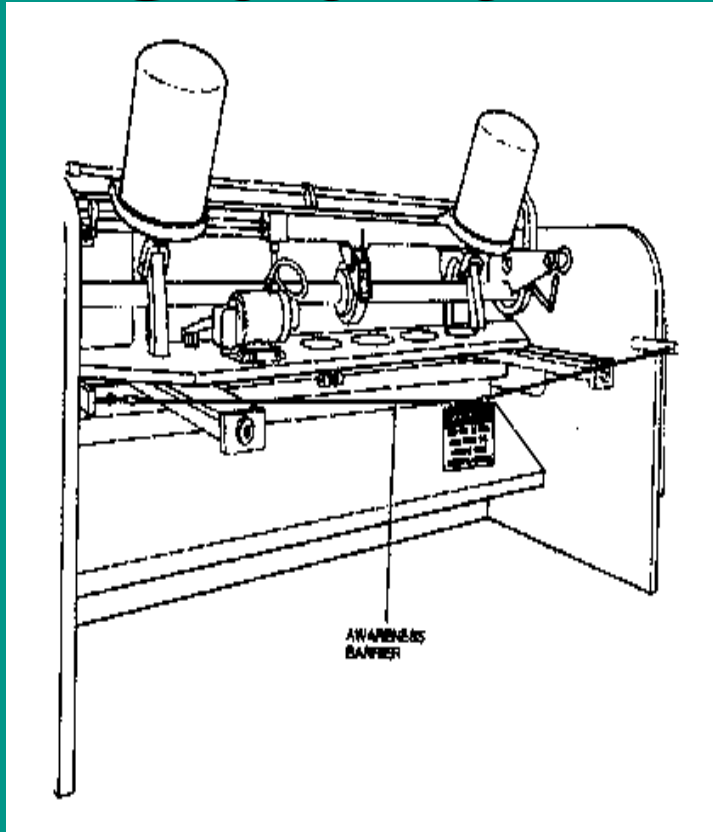
- *Moving wheels are guarded with cover plates.*
- *Adjustable guard on the blade at the point of operation.*

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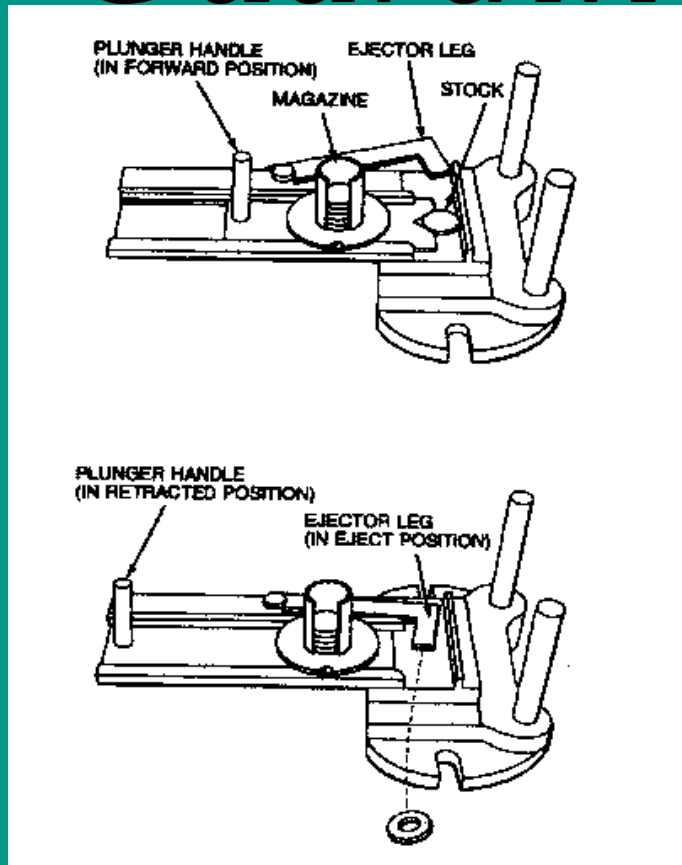
- *A shield of safety glass prevents sparks and particles from striking the worker.*
- *Rotating shafts are required to have guards on them.*

Machine Guarding



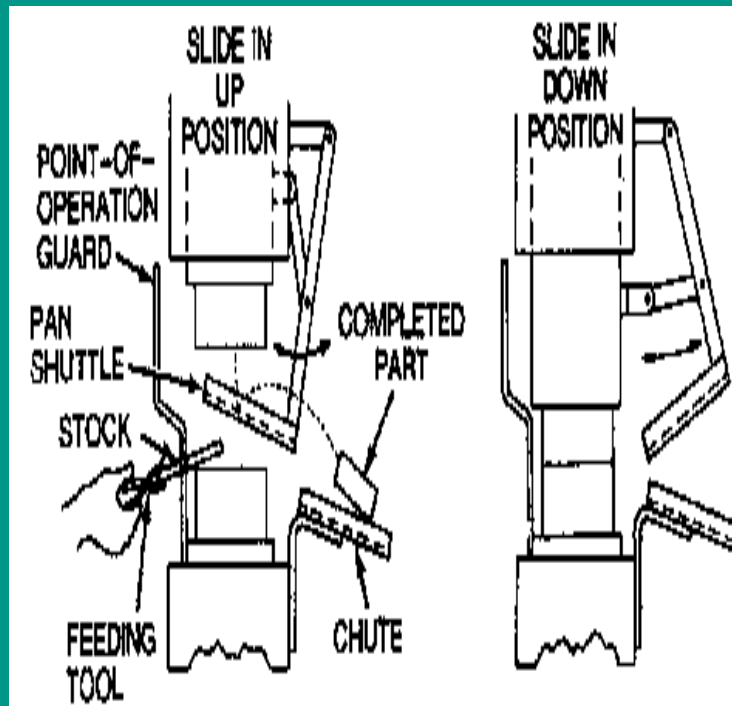
- *This machine is using a wire guard to stop the machine when a worker gets too close.*

Machine Guarding



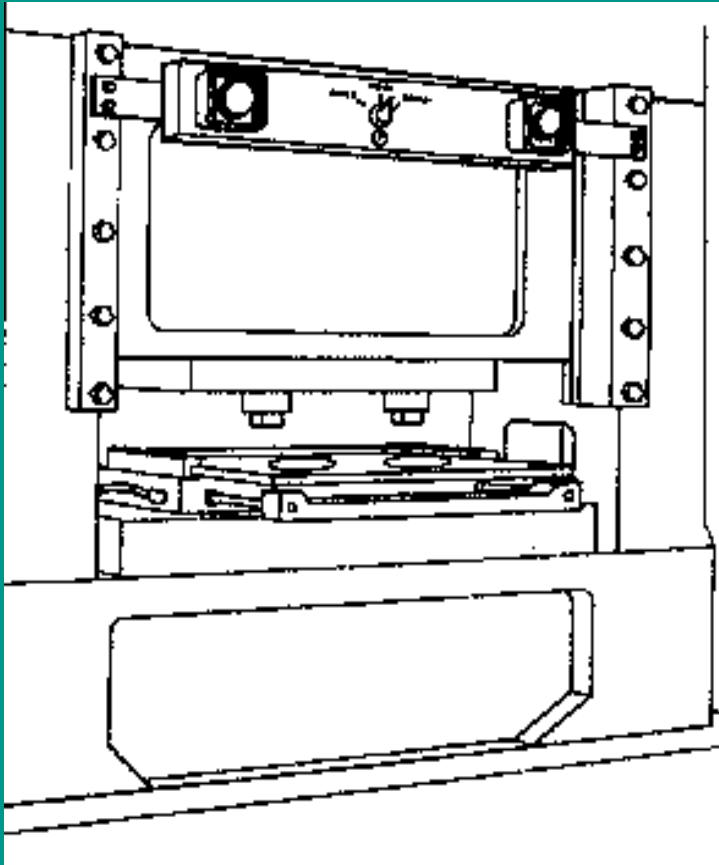
- *Instead of having the worker pick the finished product out of the die with their fingers, this system uses an automatic device to push the product out of the die.*

Machine Guarding



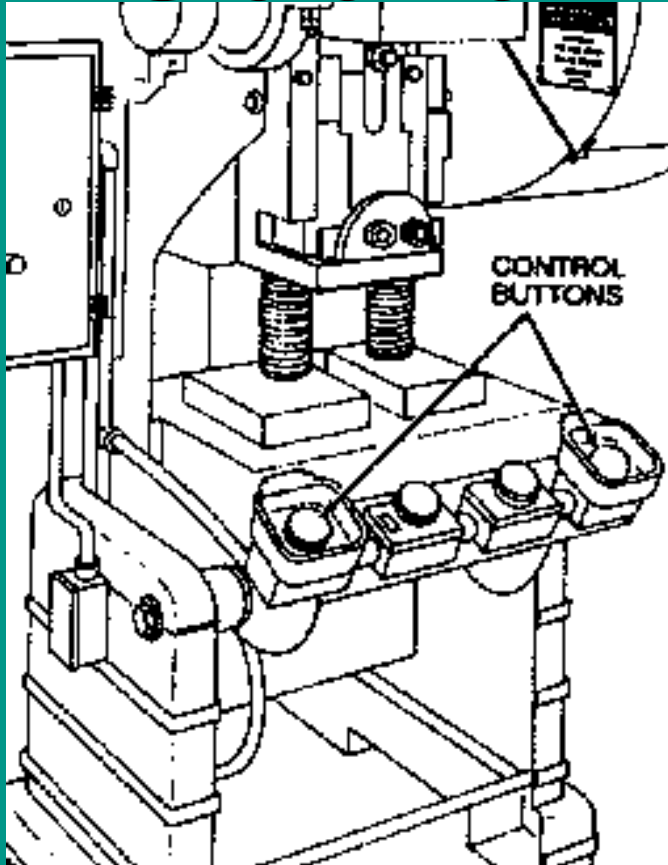
- *This machine ejects the finished product automatically.*

Machine Guarding



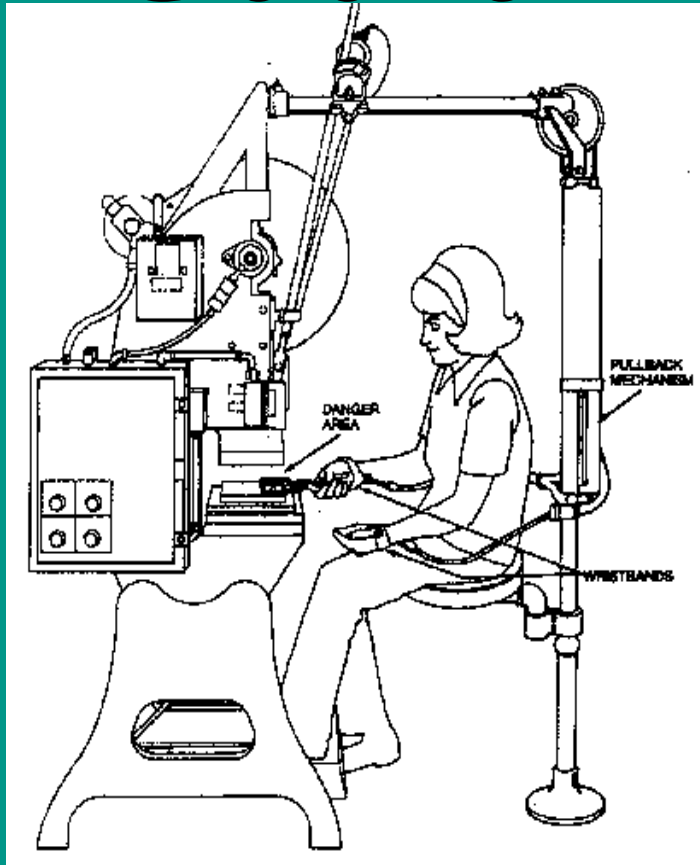
- *In order to operate this press the operator must push both buttons at the top of the machine.*
- *This insures that his hands are not in the point of operation area when the press activates.*

Machine Guarding



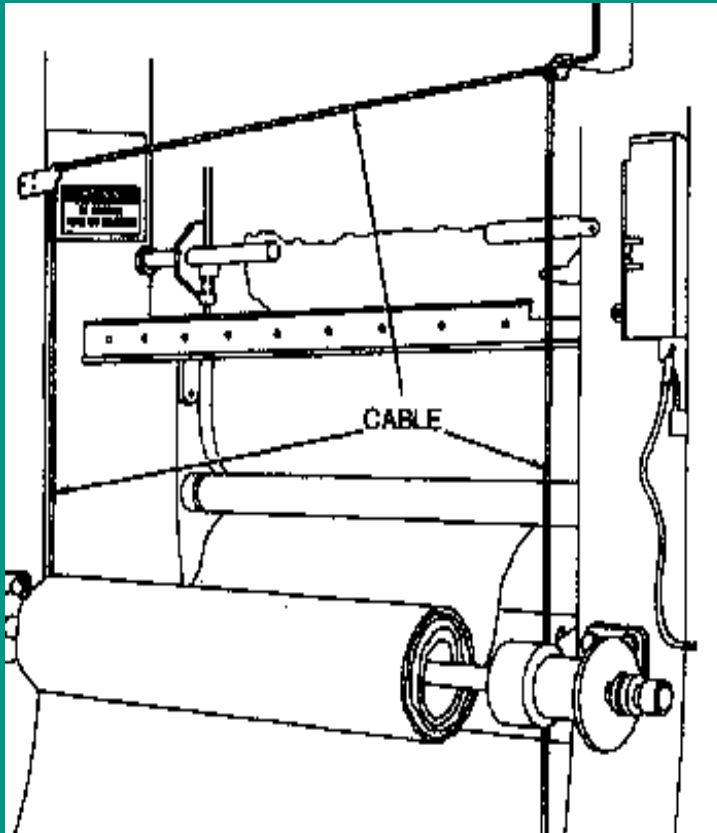
- *The operator must press both of the control buttons at the same time to operate this press.*

Machine Guarding



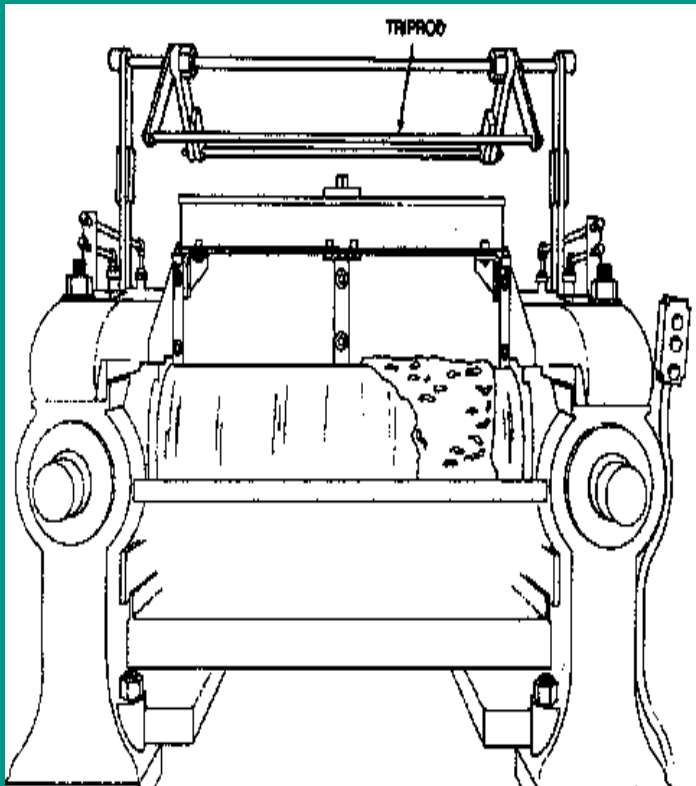
- *This operator has wrist cuffs attached to her arms to keep her from putting them in harms way.*
- *Some versions will automatically pull the operators hands back when the press cycles.*

Machine Guarding



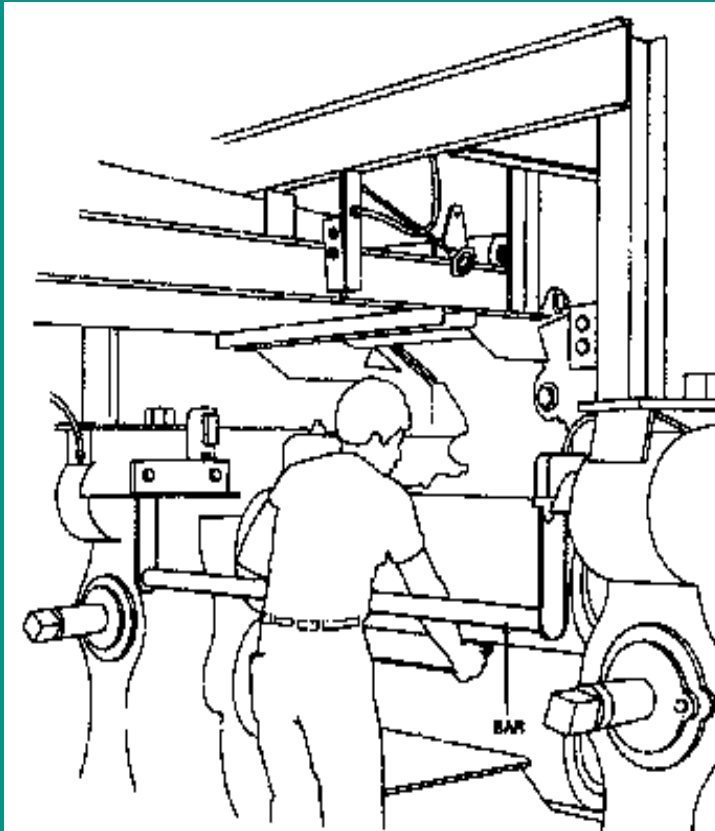
- *This cable will stop the machine when it is pulled.*

Machine Guarding



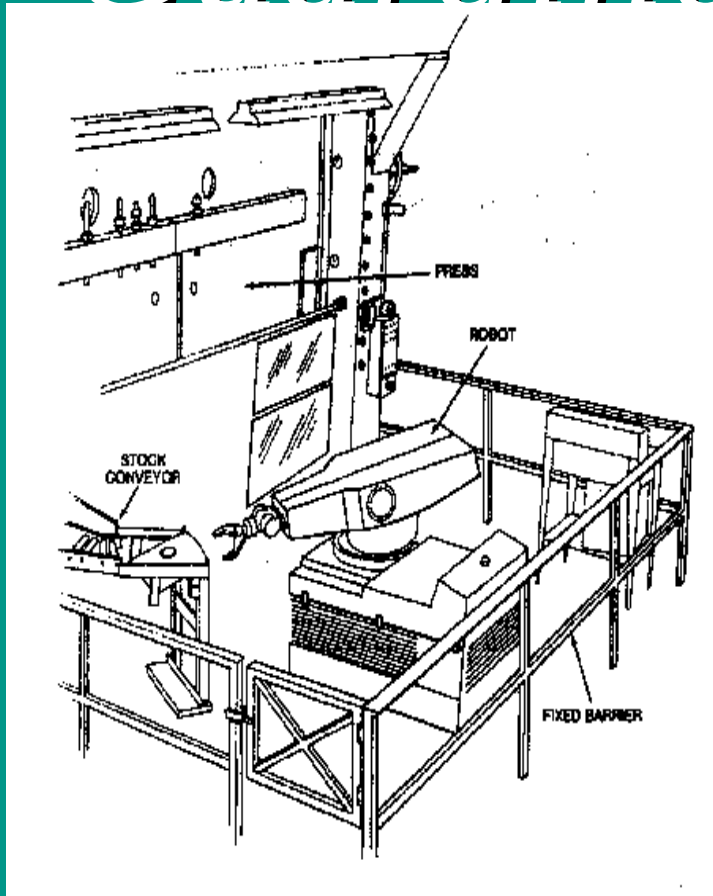
- *The tripod type bar on top of this machine can be grabbed by a worker to stop the machine.*

Machine Guarding



- *This safety bar will stop the machine if the worker gets too close to the operation area.*

Machine Guarding



- *Robots can be deadly.*
- *Establish a system to keep humans from getting into the robots work area.*
- *Maintenance workers must use a lockout system.*